

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known

Application Number	10/713,898
Filing Date	October 18, 2002
First Named Inventor	David Charles Schwartz, et al.
Art Unit	
Examiner Name	
Attorney Docket Number	960296.99047

Sheet 1 of 2

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
SKM ↓		US- 6,123,819	09-26-2000	Peeters	
		US- 2002/0037499 A1	03-28-2002	Quake et al.	
		US- 2002/0137218 A1	09-26-2002	Mian et al.	
		US- 2002/0081744 A1	06-27-2002	Chan et al.	
		US- 2003/0165964	08-04-2003	Hannah	
		US- 6,438,279 B1	08-20-2002	Craighead et al.	
		US- 6,610,256	08-26-2003	Schwartz	
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T ⁶
		Country Code ³ * Number * Kind Code ⁴ (if known)				
SKM		WO 94/18218	08-18-1994	Seq. Ltd.		
↓		WO 00/09757	02-24-2000	U.S. Genomics		
		PCT Int'l Search Report				

Examiner
Signature

/Stephanie Mummert/ (10/12/2006)

Date
Considered

10/12/2006

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

5619318

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		Complete if Known	
		Application Number	10/713,898
		Filing Date	October 18, 2002
		First Named Inventor	David Charles Schwartz, et al.
		Art Unit	
		Examiner Name	
Sheet 2	of 2	Attorney Docket Number	960296.99047

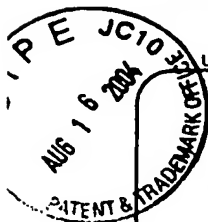
OTHER PRIOR ART–NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Chih-Ming Ho, "Fluidics - The Link Between Micro and Nano Sciences and Technologies", Proceedings of the IEEE 14th Annual International Conference On Microelectro Mechanical Systems, MEMS 2001, Interlaken, Switzerland, Jan 21-25,	
SKM		2001, IEEE International Micro Electro Mechanical Systems Conference, New York, NY: IEEE, US, vol. CONF. 14, (01-21-2001), pgs 375-384, XP010534628 ISBN: 0-7803-5998-4, pg 378-379.	
SKM		Unger M A Et Al: "Monolithic Microfabricated Valves and Pumps by Multilayer Soft Lithography", Science, American Association For The Advancement Of Science, US, vol. 288, 04/07/2000, pgs. 113-116, XP002192277 ISSN: 0036-8075 Figure 1.	
SKM		Stix, Gary; "Thinking Big-A Harvard Medical School dropout aims to usher in the personal-genomics ear," Innovations, Scientific American, June 2002, pgs. 30-31.	
SKM		Stikeman, Alexandra, "Nanobiotech Makes The Diagnosis," Technology Review, May 2002, pgs. 61-66.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
--------------------	----------------------------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.
¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.
This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 120 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Prior Art Cited in US. PATENT NO. 5,720,928



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 9

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Complete if Known

Application Number	10/713,898
Filing Date	October 18, 2002
First Named Inventor	David Charles Schwartz, et al.
Art Unit	
Examiner Name	
Attorney Docket Number	960296.99047

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code* ² (if known)			
SKM ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓		US- 4,473,452	Sep., 1984	Cantor et al.	
		US- 4,695,548	Sep., 1987	Cantor et al.	
		US- 4,737,251	Apr., 1988	Carle et al.	
		US- 4,767,700	Aug., 1988	Wallace	
		US- 4,870,004	Sep., 1989	Conroy et al.	
		US- 5,059,294	Oct., 1991	Lizardi	
		US- 5,079,169	Jan., 1992	Chu et al.	
		US- 5,314,829	May, 1994	Coles	436/165
		US- 5,380,833	Jan., 1995	Urdea	
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T ⁶
		Country Code* ³ Number * Kind Code* ⁴ (if known)				
SKM ↓ ↓		FR 2605472	Apr., 1988	Alain Bouillet		
		WO 84/02001	May, 1984	Trustees of Columbia Unvers		
		WO 87/01955	Sep., 1987	Washington University		

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
-----------------------	----------------------------------	--------------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.87 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

5619351

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known

Sheet	2	of	9	Application Number	10/713,898
				Filing Date	October 18, 2002
				First Named Inventor	David Charles Schwartz, et al.
				Art Unit	
				Examiner Name	
				Attorney Docket Number	960296.99047

OTHER PRIOR ART—NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Chattoraj et al., "DNA Condensation with Polyamines", J. Mol. Biol. 121, (1978), pp.327-337.	
		Ohi et al., "Mapping of Mitochondrial 4S RNA Genes... by Electron Microscopy", J. Mol. Biol. 212, (1978), pp 299-310.	
		Manuelidis et al, Biol. Abstr. 76(4); Ref. No. 27153; p. 2940.	
		Bensimon, A. et al., 1994, "Alignment and Sensitive Detection of DNA by a Moving Interface" Science 265: 2096.	
		Perkins, T.T. et al., 1994, "Direct Observation of Tube-like Motion of a Single Polymer Chain", 264: 819-822.	
		Cohen et al., 1993, "A first-generation physical map of the human genome", Nature 366: 698-701.	
		Guo et al., 1993, "Sizing of Large DNA Molecules by Hook Formation in a Loose Matrix", J. Biomol. Structure and Dynamics 11: 1-10.	
		Hansma, H.G. et al., 1993, "Atomic force microscopy of DNA in aqueous solutions", Nucleic Acids Research 21: 505-512.	
		Karrasch, S. et al., 1993, "Covalent Binding of Biological Samples to Solid Supports for Scanning Probe Microscopy in Buffer Solution" Biophysical J. 65: 2437-2446.	
↓		Koob et al., 1992, "RecA-AC: single-site cleavage of plasmids and chromosomes at any predetermined restriction site" Nucleic Acids Res. 20:5831.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
--------------------	----------------------------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.88. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 120 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

5619351

Please type a plus sign (+) inside this box → +

PTO/SB/08B (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>		Complete if Known	
	Application Number	10/713,898	
	Filing Date	October 16, 2002	
	First Named Inventor	David Charles Schwartz, et al.	
	Group Art Unit		
	Examiner Name		
Sheet	3	of	9
	Attorney Docket Number	960296.99047	

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials ²	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Zenhausen et al., 1992, "Imaging of DNA by Scanning Force Microscopy", J. Struct. Biol. 108: 69-73.	
		Lyubchenko et al., 1992, "Atomic Force Microscopy Imaging of Double Stranded DNA and RNA", J. Biomol. Struct. and Dyn. 10: 589-606.	
		Bustamante et al., 1992, "Circular DNA Molecules Imaged in Air by Scanning Force Microscopy", Biochemistry 31: 22-26.	
		van denEng, et al., 1992, "Estimating Genomic Distance from DNA Sequence Location in Cell Nuclei by a Random Walk Model", Science 257: 1410.	
		Allison et al., 1992, "Immobilization of DNA for scanning probe microscopy", Proc. Natl. Acad. Sci. USA 89: 10129-10133.	
		Heng et al., 1992, "High-resolution mapping of mammalian genes by in situ hybridization to free chromatin", Proc. Natl. Acad. Sci. USA 89: 9509.	
		Maier et al., 1992, "Complete coverage of the Schizosaccharomyces pombe genome in yeast artificial chromosomes", Nat. Genet. 1:273.	
		Guo et al., 1992, "Sizing single DNA molecules", Nature 359:783-784.	
		Chumakov et al., 1992, "Continuum of overlapping clones spanning the entire human chromosome 21q", Nature 359:380.	
		Link, 1991, "Physical Map of the Saccharomyces cerevisiae Genome at 110-Kilobase Resolution", Genetics 127: 681.	
V		Ferrin et al., 1991, "Selective Cleavage of Human DNA: RecA-Assisted Restriction Endonuclease (RARE) Cleavage", Science 254: 1494.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
---------------------------	----------------------------------	------------------------	------------

¹EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

² Unique citation designation number. ³ Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Patent and Trademark Office, Washington, DC 20231. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO:** Assistant Commissioner for Patents, Washington, DC 20231.

5529736

Please type a plus sign (+) inside this box → ☐

PTO/SB/08B (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449B/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Application Number	10/713,898
		Filing Date	October 16, 2002
		First Named Inventor	David Charles Schwartz, et al.
		Group Art Unit	
		Examiner Name	
Sheet 4 of 9	Attorney Docket Number	960296.99047	

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Campbell et al., 1991, "Generation of a nested series of interstitial deletions in yeast artificial chromosomes carrying human DNA", Proc. Natl. Acad. Sci. USA 88:5744.	
		Cavalli-Sforza, 1990, "Opinion: How Can One Study Individual Variation for 3 Billion Nucleotides of the Human Genome", Am. J. Hum. Genet. 46: 649.	
		Koob et al., 1990, "Cleaving Yeast and Escherichia coli Genomes at a single site", Science 250: 271-273.	
		Lichter et al., 1990, "High-Resolution Mapping of Human Chromosome 11 by in Situ Hybridization with Cosmid Clones" Science 247: 64.	
		Stallings et al., 1990, "Physical mapping of human chromosomes by repetitive sequence fingerprinting", Proc. Natl. Acad. Sci. USA 87: 6218-6222.	
		Glazer et al., 1990, "A stable double-stranded DNA-ethidium homodimer complex: Application to picogram fluorescence detection of DNA in agarose gels", Proc. Natl. Acad. Sci. USA 87: 3851.	
		Schwartz et al., 1989, "ED: pulsed electrophoresis instrument", Nature 342: 575-576.	
		Lawrence et al., 1988, "Sensitive, High-Resolution Chromatin and Chromosome Mapping In Situ: Presence and Orientation of Two Closely Integrated Copies of EBV in a Lymphoma Line", Cell 52:51	
		Barlow et al., 1987, "Genetics by gel electrophoresis: the impact of pulsed field gel electrophoresis on mammalian genetics", Trends in Genetics 3: 167-177.	
		Burke et al., 1987, "Cloning of Large Segments of Exogenous DNA into Yeast by Means of Artificial Chromosome Vectors", Science 236: 806.	
↓		Church and Gilbert, 1984, "Genomic sequencing", Proc. Natl. Acad. Sci. USA 81: 1991.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
--------------------	----------------------------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Please type a plus sign (+) inside this box → ☐

PTO/SB/08B (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449B/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Application Number	10/713,898
				Filing Date	October 16, 2002
				First Named Inventor	David Charles Schwartz, et al.
				Group Art Unit	
				Examiner Name	
Sheet	5	of	9	Attorney Docket Number	960296.99047

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Luckham and Klein, 1984, "Forces between Mica Surfaces Bearing adsorbed Polyelectrolyte, Poly-L-lysine, in Aqueous Media", Chem. Soc. Faraday Trans. I, 80: 865-878.	
		Schwartz and Cantor, 1984, "Separation of Yeast Chromosome-Sized DNAs by Pulsed Field Gradient Gel Electrophoresis", Cell 37: 67.	
		Murray and Szostak, 1983, "Construction of Artificial Chromosome in Yeast", Nature 305: 189-193.	
		Manuelidis et al., 1982, "High-resolution Mapping of Satellite DNA using Biotin-labeled DNA Probes", J. Cell Biol. 95: 619.	
		Matsumoto, et al., 1981, "Light Microscopic Structure of DNA in Solution Studied by the 4',6-Diamidino-2-phenylindole Staining Method", J. Mol. Biol. 132: 501-516.	
		Gosule and Schellman, 1978, "DNA Condensation with Polyamines", J. Mol. Biol. 121: 311-326	
		Porath and Axen, 1976, "Immobilization of Enzymes to Agar, Agarose, and Sephadex Support", Methods Enzymol. 44:19.	
		Smith and Birnstiel, 1976, "A simple method for DNA restriction site mapping", Nucleic Acids Res. 3: 2387-2399.	
		Massa et al., 1973, "Flow Properties of High-Molecular-Weight DNA Solutions: Viscosity, Recoil, and Longest Retardation Time", Biopolymers 12:.	
		Schwartz et al., 1989, "Conformational Dynamics of Individual DNA Molecules During Gel Electrophoresis", Nature 338:520.	
		Rampino and Chrambach, 1991, "Conformational correlates of DNA band compression and bidirectional migration during field inversion gel electrophoresis, detected by quantitative video epifluorescence microscopy", Biopolymers 31: 1297-1307.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
--------------------	----------------------------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

5529736

Please type a plus sign (+) inside this box → ☐

PTO/SB/08B (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449B/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Application Number	10/713,898
				Filing Date	October 18, 2002
				First Named Inventor	David Charles Schwartz, et al.
				Group Art Unit	
				Examiner Name	
Sheet	6	of	9	Attorney Docket Number	960296.99047

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Romling et al., 1989, "A physical genome map of Pseudomonas aeruginosa", EMBO J. 8(13): 4081-4089.	
		Smith et al., 1989, "Observation of Individual DNA Molecules Undergoing Gel Electrophoresis", Science 242: 203.	
		Kucherlapati et al., 1988, Genetic Recombination pp. 92-106.	
		Zubay, 1988, Biochemistry (Macmillan Publishing Company, New York) pp. 918-919.	
		Woolf et al., 1988, "Mapping genomic organization by field inversion and two dimensional gel electrophoresis", Nucleic Acids Research 16(9): 3863.	
		Carle et al., Electrophoretic Separations of Large DNA Molecules by Periodic Inversion of the Electric Field, Science 232: 65-68.	
		Poddar and Maniloff, 1986, "Chromosome analysis by two-dimensional fingerprinting", Gene 49: 93-102.	
		Stellwagen, N.C., 1985, "Orientation of DNA molecules in agarose gels by pulsed electric fields", J. Biomol. Str. and Dyn. 3(2): 299.	
		Yanagida et al., 1983, "Dynamic behaviors of DNA Molecules in solution..." Cold Spring Harbor Symp. Quant. Biol. 47: 177.	
		Dev. et al., 1982, "Techniques for chromosome analysis", Techniques in Somatic Cell Genetics, edited by Shay, pp. 493-503.	
		Manuelidis et al., 1992, "High-resolution mapping of satellite DNA using biotin-labeled DNA probes", Biol. Abstr. 76(4), Ref. No. 27153, p. 2940.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
-----------------------	----------------------------------	--------------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

5819365

Please type a plus sign (+) inside this box → ☐

PTO/SB/08B (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449B/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Application Number	10/713,898
		Filing Date	October 18, 2002
		First Named Inventor	David Charles Schwartz, et al.
		Group Art Unit	
		Examiner Name	
Sheet 7 of 9	Attorney Docket Number	960296.99047	

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Chattoraj et al., 1978, "DNA Coordination with polyamines", J. Mol. Biol. 121: 327.	
		Ohi et al., 1978, "Mapping of Mitochondria 4S RNA genes in Xenopus laevis by electron microscopy", J. Mol. Biol. 121: 299.	
		Gurrieri et al., 1990, "Imaging of kinked configurations of DNA molecules undergoing orthogonal field alternating gel electrophoresis by fluorescence microscopy", Biochemistry 29: 3396-3401.	
		Bendich and Smith, 1990, "Moving pictures and pulsed-field gel electrophoresis show linear DNA molecules form chloroplasts and mitochondria" Current Genetics 17: 421-425.	
		Smith and Bendich, 1990, "Electrophoretic charge density and persistence length of DNA as measured by fluorescence microscopy", Biopolymers 29(8-9): 1167.	
		Sturm and Weill, 1989, "Direct observation of DNA chain orientation and relaxation by electric birefringence: Implications for the mechanism of separation during pulsed-field gel electrophoresis", Physical Rev. Letters 62(13): 1484.	
		Stellwagen, 1988, "Effect of pulsed and reversing electric fields on the orientation of linear and supercoiled DNA molecules in Agarose Gels", Biochemistry 27: 6417.	
		Schwartz, et al., "Conformational Dynamics of Individual DNA Molecules During Gel Electrophoresis", Nature, Apr. 6, 1989, pp. 520-522.	
		Poddar et al., Chromosome analysis by two-dimensional fingerprinting", Gene, 49 (1986), pp. 93-102.	
		Woolf et al., "Mapping genomic organization by field inversion and two dimensional gel electrophoresis", Nucleic Acid Research, Vol. 16, No. 9 (1988), pp. 3863-3875.	
		Roemling et al., "A physical genome map of Pseudomonas aeruginosa", The EMBO Journal, Vol. 8, No. 13 (1989), pp. 4081-4089.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
--------------------	----------------------------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

5619365

Please type a plus sign (+) inside this box → ☐

PTO/SB/088 (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449B/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Application Number	10/713,898
		Filing Date	October 18, 2002
		First Named Inventor	David Charles Schwartz, et al.
		Group Art Unit	
		Examiner Name	
Sheet 8 of 9	Attorney Docket Number	960296.99047	

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials ¹	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Yanagida et al., "Dynamic Behaviors of DNA Molecules in Solution...", Cold Sprg. Hrbr. Symp. Quant. Biol. 47, pp. 177-187, 1983.	
		Zubay, Biochemistry, 1988, pp. 918-919.	
		Kucherlapati et al., Genetic Recombination, 1988, pp. 92-106.	
		Smith et al., "Observation of Individual DNA Molecules Undergoing Gel Electrophoresis", Science 242, Jan. 13, 1989 pp. 203-206.	
		Carle et al., "Electrophoretic Separations of Large DNA molecules...", Science, Apr. 4, 1986, pp. 65-68.	
		Dev. et al., "Techniques for Chromosome Analysis", Techniques in SOmatic Cell Genetics, edited by Shay, 1982, pp. 493-503.	
		Rampino, "The Physics of Gel Electrophoresis".	
		Stellwagon, "Effect of Pulsed and Reversing Electric Fields..." Biochem. 17, 1988, pp. 6417-6424.	
		Manuelidis et al., Biol. Abstr. 76(4), Ref. No. 27153, P. 2940.	
		Gerlach et al. (1984) Cytometry 5:562-571.	
		K. R. Khrapko et al., "A Method For DNA Sequencing By Hybridization With Oligonucleotide Matrix", J. DNA Sequencing and Mapping, 1991, vol. 1, pp. 375-388.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
--------------------	----------------------------------	-----------------	------------

¹EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Please type a plus sign (+) inside this box → +

PTO/SB/08B (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>		Complete If Known	
		Application Number	10/713,898
		Filing Date	October 18, 2002
		First Named Inventor	David Charles Schwartz, et al.
		Group Art Unit	
		Examiner Name	
Sheet	9	of	9
		Attorney Docket Number	960296.99047

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials [*]	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		R. C. Williams, "Use Of Polylysine For Adsorption Of Nucleic Acids and Enzymes To Electron Microscope Specimen Films", Proc. Natl. Acad. Sci. USA, vol. 74, No. 6, pp. 2311-2315, Jun. 1977.	
SKM		F. Fish et al., "A sensitive Solid Phase Microradioimmunoassay For Anti-Dougle Stranded DNA Antibodies", Arthritis and Rheumatism, vol. 24, No. 3 (Mar. 1981).	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
-----------------------	----------------------------------	--------------------	------------

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

5619387

Prior Art Cited in U.S. Patent No. 6,294,136

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet **1** of **8**

Complete if Known

Application Number	10/713,898
Filing Date	October 18, 2002
First Named Inventor	David Charles Schwartz, et al.
Art Unit	
Examiner Name	
Attorney Docket Number	960296.99047

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
SKM ↓		US- 4,473,452	Sep., 1984	Cantor et al.	204/180
		US- 4,695,548	Sep., 1987	Cantor et al.	435/179
		US- 4,737,251	Apr., 1988	Carle et al.	204/182
		US- 4,767,700	Aug., 1988	Wallace	435/6
		US- 4,870,004	Sep., 1989	Conroy et al.	435/6
		US- 5,059,294	Oct., 1991	Lizardi	204/458
		US- 5,079,169	Jan., 1992	Chu et al.	436/174
		US- 5,314,829	May, 1994	Coles	436/165
		US- 5,380,833	Jan., 1995	Urdea	536/22
		US- 5,720,928	Feb., 1998	Schwartz	422/186
		US- 5,985,549	Nov., 1999	Singer et al.	435/6
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁴
		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				
SKM ↓		FR 2605472	Apr., 1988	Alain Bouillet		
		WO 84/02001	May, 1984	Trustees of Columbia Univers		
		WO 87/01955	Sep., 1987	Washington University		

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
--------------------	----------------------------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.87 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

5619336

Substitute for form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		Complete If Known			
		Application Number	10/713,898		
		Filing Date	October 18, 2002		
		First Named Inventor	David Charles Schwartz, et al.		
		Art Unit			
		Examiner Name			
Sheet	2	of	8	Attorney Docket Number	960296.99047

OTHER PRIOR ART–NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Allison et al., 1992, "Immobilization of DNA for Scanning Probe Microscopy", Proc. Natl. Acad. Sci. USA 89: 10129-10133.	
		Barlow and Lehrach, 1987, "Genetics by Gel Electrophoresis: The Impact of Pulsed Field Gel Electrophoresis on Mammalian Genetics", Trends in Genetics 3: 167-171.	
		Bendich and Smith, 1990, "Moving Pictures and Pulsed-Field Gel Electrophoresis Show Linear DNA Molecules Form Chloroplasts and Mitochondria" Current Genetics 17: 421-425.	
		Bensimon, et al., 1994, "Alignment and Sensitive Detection of DNA by a Moving Interface" Science 265: 2096-2098.	
		Burke et al., 1987, "Cloning of Large Segments of Exogenous DNA into Yeast by Means of Artificial Chromosome Vectors", Science 236: 806-812.	
		Bustamante et al., 1992, "Circular DNA Molecules Imaged in Air by Scanning Force Microscopy", Biochemistry 31: 22-26.	
		Campbell et al., 1991, "Generation of a Nested Series of Interstitial Deletions in Yeast Artificial Chromosomes Carrying Human DNA", Proc. Natl. Acad. Sci. USA 88: 5744-5748.	
		Carle et al., 1986, "Electrophoretic Separations of Large DNA Molecules by Periodic Inversion of the Electric Field", Science 232: 65-68.	
		Cavalli-Sforza, 1990, "Opinion: How Can One Study Individual Variation for 3 Billion Nucleotides of the Human Genome", Am. J. Hum. Genet. 46: 649-651.	
		Chattoraj et al., 1978, "DNA Coordination with Polyamines", J. Mol. Biol. 121: 327-337.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
--------------------	----------------------------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 120 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Please type a plus sign (+) inside this box → +

PTO/SB/08B (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>		Complete if Known	
		Application Number	10/713,898
		Filing Date	October 18, 2002
		First Named Inventor	David Charles Schwartz, et al.
		Group Art Unit	
		Examiner Name	
Sheet	3	of	8
		Attorney Docket Number	960296.99047

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Chumakov et al., 1992, "Continuum of Overlapping Clones Spanning the Entire Human Chromosome 21q", Nature 359: 380-387.	
		Church and Gilbert, 1984, "Genomic Sequencing", Proc. Natl. Acad. Sci. USA 81: 1991-1995.	
		Cohen et al., 1993, "A First-Generation Physical Map of the Human Genome", Nature 366: 698-701.	
		Dev et al., 1982, "Techniques for Chromosome Analysis", Techniques in Somatic Cell Genetics, edited by Shay, pp. 493-503.	
		Ferrin and Camerini-Otero, 1991, "Selective Cleavage of Human DNA: RecA-Assisted Restriction Endonuclease (RARE) Cleavage", Science 254: 1494-1497.	
		Fish and Ziff, 1981, "A Sensitive Solid Phase Microradiolimmunoassay for Anti-Double Stranded DNA Antibodies", Arthritis and Rheumatism 24: 534-543.	
		Gerlach et al., 1984, "Application of a High-Resolution TV-Microscope System to Estimate the Sequence of Centromere Separation in Muntjak Chromosomes", Cytometry 5: 562-571.	
		Glazer et al., 1990, "A Stable Double-Stranded DNA-Ethidium Homodimer Complex: Application to Picogram Fluorescence Detection of DNA in Agarose Gels", Proc. Natl. Acad. Sci. USA 87: 3851-3855.	
		Gosule and Schellman, 1978, "DNA Condensation with Polyamines I. Spectroscopic Studies", J. Mol. Biol. 121: 311-326.	
↓		Guo et al., 1993, "Sizing of Large DNA Molecules by Hook Formation in a Loose Matrix", J. Biomol. Struct. and Dynam. 11: 1-10.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
-----------------------	----------------------------------	--------------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

5619341

Please type a plus sign (+) inside this box → +

PTO/SB/08B (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				Complete if Known	
		Application Number	10/713,898		
		Filing Date	October 18, 2002		
		First Named Inventor	David Charles Schwartz, et al.		
		Group Art Unit			
		Examiner Name			
Sheet	4	of	8	Attorney Docket Number	960296.99047

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Guo et al., 1992, "Sizing Single DNA Molecules", Nature 359: 783-784.	
		Gurrieri et al., 1990, "Imaging of Kinked Configurations of DNA Molecules Undergoing Orthogonal Field Alternating Gel Electrophoresis by Fluorescence Microscopy", Biochemistry 29: 3396-3401.	
		Hansma et al., 1993, "Atomic Force Microscopy of DNA in Aqueous Solutions", Nucl. Acid Res. 21: 505-512.	
		Heng et al., 1992, "High-Resolution Mapping of Mammalian Genes by in situ Hybridization to Free Chromatin", Proc. Natl. Acad. Sci. USA 89: 9509-9513.	
		Karrasch, et al., 1993, "Covalent Binding of Biological Samples to Solid Supports for Scanning Probe Microscopy in Buffer Solution", Biophysical J. 65: 2437-2446.	
		Koob et al., 1992, "RecA-AC: Single-Site Cleavage of Plasmids and Chromosomes at Any Predetermined Restriction Site", Nucl. Acids Res. 20: 5831-5836.	
		Koob and Szybalski, 1990, "Cleaving Yeast and Escherichia coli Genomes at a Single Site", Science 250: 271-273.	
		Khrapko et al., 1991, "A Method for DNA Sequencing by Hybridization with Oligonucleotide Matrix", J. DNA Sequencing and Mapping, 1: 375-388.	
		Kucherlapati et al., 1988, Genetic Recombination p. 92-106.	
		Lawrence et al., Mapping In Situ: Presence and Orientation of Two Closely Integrated Copies of EBV in a Lymphoma Line", Cell 52: 51-61.	
↓		Lichter et al., 1990, "High-Resolution Mapping of Human Chromosome 11 by in Situ Hybridization with Cosmid Clones", Science 247: 64-69.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
--------------------	----------------------------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

5619341

Please type a plus sign (+) inside this box → +

PTO/SB/08B (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>		Complete if Known	
Sheet	5	of	8
		Application Number	10/713,898
		Filing Date	October 18, 2002
		First Named Inventor	David Charles Schwartz, et al.
		Group Art Unit	
		Examiner Name	
		Attorney Docket Number	960296.99047

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Link and Olson, 1991, "Physical Map of the Saccharomyces cerevisiae Genome at 110-Kilobase Resolution", Genetics 127: 681-698.	
		Lodish et al., 1995, Molecular Cell Biology, W.H. Freeman, NY, p. 345.	
		Luckham and Klein, 1984, "Forces Between Mica Surfaces Bearing Adsorbed Polyelectrolyte, Poly-L-lysine, in Aqueous Medi", J. Chem. Soc. Faraday Trans. 1, 80: 865-878.	
		Lyubchenko et al., 1992, "Atomic Force Microscopy Imaging of Double Stranded DNA and RNA", J. Biomol. Struct. and Dynam. 10: 589-606.	
		Maier et al., 1992, "Complete Coverage of the Schizosaccharomyces pombe Genome in Yeast Artificial Chromosomes", Nat. Genet. 1: 273-277.	
		Manuelidis et al., 1982, "High-Resolution Mapping of Satellite DNA Using Biotin-Labeled DNA Probes", J. Cell. Biol. 95: 619-625.	
		Massa, 1973, "Flow Properties of High-Molecular-Weight DNA Solutions: Viscosity, Recoil, and Longest Retardation Time", Biopolymers 12: 1071-1081.	
		Matsumoto et al., 1981, "Light Microscopic Structure of DNA in Solution Studied by the 4',6-Diamidino-2-phenylindole Staining Method", J. Mol. Biol. 152: 501-516.	
		Murray and Szostak, 1983, "Construction of Artificial Chromosomes in Yeast", Nature 305: 189-193.	
		Ohi et al., 1978, "Mapping of Mitochondria 4S RNA Genes in Xenopus laevis by Electron Microscopy", J. Mol. Biol. 121: 299-310.	
↓		Perkins et al., 1994, "Direct Observation of Tube-like Motion of a Single Polymer Chain", Science 264: 819-822.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
-----------------------	----------------------------------	--------------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

5619341

Please type a plus sign (+) inside this box → +

PTO/SB/08B (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>			Complete if Known	
	Application Number	10/713,898		
	Filing Date	October 18, 2002		
	First Named Inventor	David Charles Schwartz, et al.		
	Group Art Unit			
	Examiner Name			
Sheet	6	of	8	Attorney Docket Number 960296.99047

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Poddar and Maniloff, 1986, "Chromosome Analysis by Two-Dimensional Fingerprinting", Gene 49: 93-102.	
		Porath and Axen, 1976, "Immobilization of Enzymes to Agar, Agarose, And Sephadex Supports", Meth. Enzymol. 44: 19-45.	
		Rampino and Chrambach, 1991, "Conformational Correlatives of DNA Band Compression and Bidirectional Migration During Field Inversion Gel Electrophoresis, Detected by Quantitative Video Epifluorescence Microscopy", Biopolymers 31: 1297-1307.	
		Romling et al., 1989, "a Physical Genome Map of Pseudomonas aeruginosa", EMBO J. 8: 4081-4089.	
		Schwartz et al., 1989, "Conformational Dynamics of Individual DNA Molecules During Gel Electrophoresis", Nature 338: 520-522.	
		Schwartz et al., 1989, "ED: Pulsed Electrophoresis Instrument", Nature 342: 575-576.	
		Schwartz et al., 1984, "Separation of Yeast Chromosome-Sized DNAs by Pulsed field Gradient Gel Electrophoresis", Cell 37: 67-75.	
		Smith et al., 1992, "Direct Mechanical Measurements of the Elasticity of Single DNA Molecules by Using Magnetic Beads", Science 258: 1122-1126.	
		Smith and Bendich, 1990, "Electrophoretic Charge Density and Persistence Length of DNA as Measured by Fluorescence Microscopy", Biopolymers 29: 1167-1173.	
		Smith et al., 1989, "Observation of Individual DNA Molecules Undergoing Gel Electrophoresis", Science 242: 203-206.	
↓		Smith and Bimstiel, 1976, "A Simple Method for DNA Restriction Site Mapping", Nucl. Acids Res. 3: 2387-2399.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
--------------------	----------------------------------	-----------------	------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

5619348

Please type a plus sign (+) inside this box → +

PTO/SB/08B (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U. S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>		Complete if Known	
	Application Number	10/713,898	
	Filing Date	October 18, 2002	
	First Named Inventor	David Charles Schwartz, et al.	
	Group Art Unit		
	Examiner Name		
Sheet	7	of	8
	Attorney Docket Number	960296.99047	

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials [*]	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
SKM		Southern, 1975, "Detection of Specific Sequences among DNA Fragments Separated by Gel Electrophoresis", J. Mol. Biol. 98: 503-517.	
		Stallings et al., 1990, "Physical Mapping of Human Chromosomes by Repetitive Sequence Fingerprinting", Proc. Natl. Acad. Sci. USA 87: 6218-6222.	
		Stellwagen, 1988, "Effect of Pulsed and Reversing Electric Fields on the Orientation of Linear and Supercoiled DNA Molecules in Agarose Gels", Biochemistry 27: 6417-6424.	
		Stellwagen, N.C., 1985, "Orientation of DNA Molecules in Agarose Gels by Pulsed Electric Fields", J. Biomol. Str. and Dynam. 3: 299-314.	
		Sturm and Weill, 1989, "Direct Observation of DNA Chain Orientation and Relaxation by Electric Birefringence: Implications for the Mechanism of Separation During Pulsed-Field Gel Electrophoresis", Physical Rev. Letters 62: 1484-1487.	
		van den Engh et al., 1992, "Estimating Genomic Distance from DNA Sequence Location in Cell Nuclei by a Random Walk Model", Science 257: 1410-1412.	
		Williams, 1977, "Use of Polyisiline for Adsorption of Nucleic Acids and Enzymes to Electron Microscope Specimen Films", Proc. Natl. Acad. Sci. USA 74: 2311-2315.	
		Woolf et al., 1988, "Mapping Genomic Organization by Field Inversion and Two Dimensional Gel Electrophoresis", Nucl. Acids Res. 16: 3863-3875.	
		Yanagida et al., 1983, "Dynamic Behaviors of DNA Molecules in Solution..." Cold Spring Harbor Symp. Quant. Biol. 47: 177-187.	
		Zenhausen et al., 1992, "Imaging of DNA by Scanning Force Microscopy", J. Struct. Biol. 108: 69-73.	
V		Zubay, 1988, Biochemistry (Macmillan Publishing Company, New York) pp. 918-919.	

Examiner Signature	/Stephanie Mummert/ (10/12/2006)	Date Considered	10/12/2006
-------------------------------	----------------------------------	----------------------------	------------

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

(Use as many sheets as necessary)

Complete if Known

Sheet	1	of	1
-------	---	----	---

418730